

**DENTAL IMPRESSION TRAY**

This invention relates to a tray for supporting dental impression material during the making of an impression of a patient's dentition.

5

**BACKGROUND OF THE INVENTION**

Impressions of patients' dentitions are produced for a variety of purposes among which are procedures for the manufacture of appliances for bite registrations, crown and bridge constructions, and the like. There generally are five types of impression supporting trays used by a dentist for specific applications. These trays are the posterior, anterior, full arch, quadrant, and sideless posterior. The tray is used simply as a carrier for the impression-forming material and to facilitate the placing and removal of the impression material in and from a patient's mouth.

In use, the tray is filled with a pliable, uncured putty or silicone impression material and seated in a patient's mouth until the material sets or cures. Within a few minutes' time the material will set, but remain pliable and not distort when removed from the patient's mouth.

When the tray containing the impression material is removed from the patient's mouth an accurate negative impression of the tooth or teeth requiring the performance of a dental procedure is completed. The negative impression is used to form an

accurate duplicate of the patient's dentition,  
following which a dental appliance may be produced on a  
stone model.

Although many different kinds of impression  
5 trays are available, not all of them enable good  
quality dental appliances to be produced. The reasons  
for this are several, including distortion of the tray  
due to inadequate rigidity either during the placing of  
the impression material on the tray or the placing of  
10 the tray in the mouth of a patient. Further, other  
failures of dental appliances are due to the impression  
material pulling away from the tray borders.

A principal object of the invention is to  
provide a dental impression tray which overcomes or  
15 greatly minimizes the disadvantages referred to above.

#### SUMMARY OF THE INVENTION

A dental impression tray constructed in  
accordance with one embodiment of the invention has a  
generally U-shaped frame having two substantially  
20 parallel limbs joined at corresponding ends by a  
connector. Each limb has a buccal or outer edge and a  
lingual or inner edge. Adjacent the outer edge of each  
limb is an upstanding wall. Adjacent the inner edge of  
each limb is a plurality of upstanding projections  
25 spaced from one another and also spaced from the  
adjacent outer wall. The space between the outer wall  
and the projections of each limb forms a web. Each web

is pierced by a plurality of longitudinally spaced apertures or openings.

In one embodiment the outer wall of each limb extends uniformly in opposite directions from the level of the associated web. The projections associated with  
5 each limb also extend in two opposite directions from the level of the web. The height of the projections from the level of the associated web preferably is less than the height of the outer wall.

10 The connector which joins the corresponding ends of the limbs preferably is thinner than the limbs themselves, thereby facilitating the ability of the dental technician to place a tray in an appropriate position in a patient's mouth.

15 Spanning the limbs and preferably integrally molded with the latter is a support for dental impression material. The support preferably is of mesh construction having openings therein through which the dental impression material may pass from one side of  
20 the support to the other.

In those instances in which the dental practitioner wishes to make an impression of both the upper and lower teeth of a patient, the uncured dental impression material may be placed on both sides of the  
25 support prior to placing the tray in a patient's mouth. When the tray is placed in the patient's mouth and the patient clinches his jaw to form an impression in the

impression material of both the upper and lower teeth, the outer walls will restrict outward movement of the impression material, the projections will restrict inward and longitudinal movements of the impression material, and the openings formed in the web and in the support mesh will provide an interlock between those portions of the impression material on opposite sides of the webs and the support.

In another embodiment of the invention the tray has the limbs, projections, apertures, and impression material support as described above. However, the outer walls and the inner projections extend upwardly from one side only of the limbs.

#### THE DRAWINGS

A dental impression tray constructed in accordance with the invention is illustrated in the accompanying drawings wherein:

Figure 1 is a top plan view of one embodiment of a tray;

Figure 2 is a side elevational view;

Figure 3 is a cross sectional view taken on the line 3-3 of Figure 1;

Figure 4 is an enlarged cross sectional view of one of the limbs shown in Figure 3; and

Figure 5 is a fragmentary elevational view of a portion of one of the limbs.

THE PREFERRED EMBODIMENTS

A tray constructed in accordance with the embodiment shown in Figure 1 is designated generally by the reference character 1 and comprises a U-shaped frame 2 having a pair of spaced apart, generally parallel limbs 3 and 4 joined at corresponding ends by a substantially semicircular connector 5. At the free end of the limb 3 is a large area handle or grip 6 joined to the limb by a stem 7. The area of the grip 6 is sufficient to facilitate the transfer of the tray from one person's hand to another person's hand.

The tray parts thus far described preferably are unitarily molded from an elastomeric material of the kind conventionally used for the making of dental impression trays, such as a moldable glass-filled nylon substance, but any one of a number of readily available materials may be used in the formation of the tray limbs and handle. One suitable impression material adapted for use with the tray is a pliable, putty-like silicone substance which is readily available in the marketplace.

The components of the tray thus far described preferably are molded integrally with a support 8 formed of open mesh netting which spans the limbs 3 and 4. The mesh may be composed of any one of a number of suitable plastic gauzes having fairly uniformly spaced openings 9 therethrough.

Each of the limbs 3 and 4 has an outer or buccal wall 10 which is of such height as to extend both above and below the level of the mesh 8. At the lingual edge of each limb 3 and 4 is a row of  
5 projections 11 which, as shown, also extend above and below the level of the mesh 8. The projections 11 are spaced from the adjacent wall 10 by a web 12 which has a plurality of spaced openings 13 extending therethrough.

10 Each projection 11 is spaced from its adjacent projection by a gap 14. The openings 13 inboard of the ends of each row are positioned adjacent the gap between adjacent projections 11. The openings at the ends of the rows are adjacent, but outboard of,  
15 the terminal projections. The mesh 8 preferably is of such size as to span not only the space between the limbs 3 and 4, but also the openings 13.

The construction and arrangement of the impression tray are such that dental impression  
20 material (not shown) may be placed in overlying relation on opposite sides of the supporting mesh 8 and in such quantity as to ensure lateral displacement of portions of the material outwardly against the buccal walls 10 when the tray and impression material  
25 supported thereby are placed in a patient's mouth and the patient moves his jaw in such manner as to compress the impression material between the upper and lower

teeth. As the patient's teeth move into the impression material the latter will be displaced laterally against the buccal walls 3 and 4 as well as against the projections 11. The impression material also will be  
5 displaced vertically whereupon the space between the walls 3 and 4 and their adjacent rows of projections, as well as the gaps between adjacent projections will be filled with the dental impression material. In addition, the openings 13 in the webs 12 will be filled  
10 with the dental impression material. Those portions of the mesh 8 which span the openings 13 assist in retaining the impression material in such openings.

As the patient's teeth enter the impression material supported by the tray the impression material  
15 will be displaced both laterally and vertically, as has been indicated. Laterally outward displacement will be restrained by the buccal walls 10, thereby avoiding excessive lateral displacement of the impression material. The projections 11 also will restrain to  
20 some extent inward displacement of the impression material. However, the principal function of the projections and their associated gaps is to prevent or minimize movement of the impression material laterally and longitudinally of the limbs during the setting of  
25 the impression material and removal of the tray from a patient's mouth, thereby ensuring a faithful reproduction of the patient's dentition. The filling

of the openings 9 and 13 in the mesh 8 and the web 12, respectively, also participates in minimizing any tendency on the part of the impression material to shift its position during the setting of such material.

5               Once the dental impression material has become set, it nevertheless is elastically pliable so as to permit removal from the patient's mouth without distortion.

              The embodiment disclosed in the drawings  
10 includes buccal walls and lingual projections which extend both above and below the level of the support mesh 8. However, it is possible to provide and utilize a tray wherein the buccal walls and lingual projections project in one direction only from the level of the  
15 mesh. Nevertheless, the interlock between the impression material and the tray provided by the projections, the gaps between the projections, and the openings in the webs ensure appropriate avoidance of shifting of the impression material during the making  
20 of the impression and the removal of the hardened or set mold from the patient's mouth.

              The tray disclosed in the drawings constitutes a posterior tray. The principles of the invention, however, are equally applicable to quadrant,  
25 anterior, sideless, and full arch trays.

              The disclosed embodiment is representative of a presently preferred form of the invention, but is



intended to be illustrative rather than definitive thereof. The invention is defined in the claims.